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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/800,455

03/15/2004

Caiguo Gong

2004B019

1216

23455 7590 03/14/2007
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EXAMINER

WYROZEBSKI LEE, KATARZYNA I

ART UNIT

PAPER NUMBER

1714

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

03/14/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/800,455

Applicant(s)

GONG ET AL.

Examiner

Katarzyna Wyrozewski

Art Unit

1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 February 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>11/10/06; 2/15/05; 6/29/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

The examiner acknowledges applicant's election of species to be phenols in their response dated 2/20/2007.

Note-Claims

The present claims are directed to polyolefin nanocomposite comprising stabilizing functionality. The above independent claims can be read in two ways. One that the composition comprises clay, polyolefin and stabilizer and second, that the composition comprises clay and functionalized polyolefin, wherein the functionality is phenolic in nature.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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2. Claims 3, 14 and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Term substituted renders claim indefinite, since there is no clear and consists definition as to what exactly the substituents are.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-9, 11-14, 16, 17, 19 are rejected under 35 U.S.C. 102(b) as being anticipated by NIYOGI (US 6,451,897).

The prior art of NIYOGI discloses composition for polyolefin clay nanocomposite, wherein the clay is an organoclay and intercalating polyolefin is a graft polymer.

The clay of NIYOGI is smectite type clay such as montmorillonite, saponite, beidelite, hectorite and the like. Clays of NIYOGI are modified using organic compounds such as ammonium to render clay organophilic. Examples of ammonium compounds include dodecyl ammonium, octadecyl ammonium, octadecyl ammonium and the like. Amount of clay in total composition of NIYOGI is in a range of 0.5-10 wt %.

Grafting monomers include phenolic compounds such as phenylethyl and phenoxyethyl compounds. Combinations of the compounds can also be used.

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The organoclay is mixed in situ with grafting monomer and intercalating polypropylene to form nanocomposite. The nanocomposite is then utilized in composition with additional olefinic polymers in articles such as household goods, sport equipments, bottles, automotive articles, electronics, films and laminated.

Additional polymers of NIYOGI include following:

Component b, which is copolymer of ethylene and propylene or copolymer of ethylene and olefin having 4-8 carbon atoms.

And, component c, which is elastomeric polyolefin, including EPM, EPDM, EBM, EOM and the like.

In the light of the above disclosure the prior art of NIYOGI anticipates requirements of rejected claims.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

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4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
8. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over NIYOGI (US 6,451,897) in view of MULLINS (US 6,410,629).

The discussion of the disclosure of NIYOGI from paragraph 4 above is incorporated here by reference.

The difference between the present invention and the disclosure of NIYOGI is specific recitation of stabilizing monomer.

With respect to the above difference the prior art of MULLINS discloses polyolefin that is stabilized with hindered phenolic compound. The hindered phenolic compound is incorporated during polymerization of the polyolefins and it is hindered enough so that it does not interfere with the polymerization process itself. The amount of inhibitor is in a range of 0.001-5 by the weight of monomer utilized in polymerization.

Stabilization disclosed in MULLINS reduces deterioration of the polymer due to presence of free radicals. It also gives composition having good mixing properties and avoids melting step in formation of products during which such inhibitor would have to be added.

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In the light of the above disclosure it would have been obvious to one having ordinary skill in the art at the time of the instant invention to utilize stabilization of MULLINS in the composition of NIYOGI and still obtain the claimed invention especially polypropylene polymer. Polypropylene polymers are especially susceptible to molecular weight degradation due to free radicals. Such modification would also allow intercalation of the polymeric component between the clay platelets as it would with the phenolic substituents of NIYOGI.

9. Following prior art Has been found and it is cited:

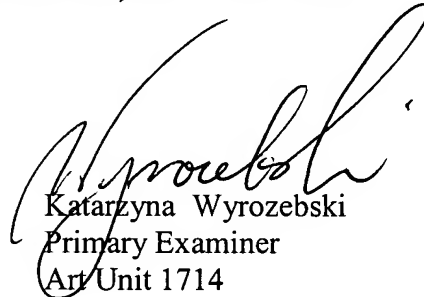
Sandrine Moriat-Therias et al. Photo-oxidation of Polypropylene/Montmorillonite Nanocomposites and Interactions with Antioxidants *Chem Mater* **2005**, 17, 1072-1078
Davelly Williams et al., US 4,520,171; Tomova et al. US 2007/0004842; Chung et al. US 2005/0014905; Wermter et al. US 2006/0122308.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katarzyna Wyrozebski whose telephone number is (571) 272-1127. The examiner can normally be reached on Mon-Thurs 6:30 AM-4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571) 272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Katarzyna Wyrozebski
Primary Examiner
Art Unit 1714

March 12, 2007